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ABSTRACT

This study addressed the status quo of instructional software produced by national Saudi Arabian software companies as well as the utilization of commercially produced software at selected 1-12 private schools in Riyadh, Saudi Arabia. Descriptive data from a survey of general managers of four major software producers are reported, as well as from principals of selected private schools. Percentages and frequencies were used for data analysis. Results were as follows: enrichment, computer literacy, and individualized instruction are major uses of instructional software; available software support most elementary and secondary grade levels and subject matters; individual students and private schools are the major target audience for instructional software; formative evaluation is not present in the development process; annual computer exhibits are the major information source about available software; and certain perceived barriers challenge the expansion of computer based instruction in Saudi education. The paper includes recommendations to enhance the status quo of software production and utilization. (Contains 14 references.) (Author/AEF)

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Computer Based Instruction in Saudi Education: A Survey of Commercially Produced Software

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Computer Based Instruction in Saudi Education: A Survey of Commercially Produced Software

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Abstract:

Computer based instruction is gaining wide spread. This study addressed the status quo of instructional software produced by national Saudi software companies as well as utilization of commercially produced software at selected 1-12 private schools in Riyadh. Descriptive data from a survey of general managers of four major software producers (n=4) are reported, as well as from principals of selected private schools (n=26). Percentages and frequencies were used for data analysis. Results were as follows: enrichment, computer literacy and individualized instruction are major patterns of software utilizations; available software support most 1-12 grade levels and subject matters; individual students and private schools are major target audience. formative evaluation is not present in the development process; annual computer exhibits are the major information source about available software; and certain perceived barriers face expansion of computer based instruction in Saudi education. Recommendations to enhance the status quo of software production and utilization are included.

Introduction:

Investment in information technology for instructional purposes is a hot topic. Schools every where have felt the need to respond to pressures imposed upon them by the informative revolution and related advances in computer technology in order to better prepare young generations to live in an ever changing society. Such movement is inspired by high expectations of the role that information technology can play in educational reform. Saudi Arabian educational system is not an exception. The general policy of education in the Kingdom of Saudi Arabia has emphasized the importance of integrating computer technology into education. Results of a recent study (Al-Fantuk & Al-Sultan, 1999) revealed that more than 70% of teachers and students in the study supported the use of computer in the classroom and that number of computer sets in secondary schools has jumped from 5336 sets in 1992 to 24045

sets in 1998, thus, decreasing the ratio of students to computer sets in these schools from one computer set for each 24.7 students in 1992 to one computer set for each 12.4 students in 1998. Currently three computer courses (one course a year – 2 classes a week) are required of all students at grades 10-12 in Saudi Arabia. In public schools computer training is currently offered by Future Kids Company, along with training offered by the Ministry of Education.

To catch up with the growing demand for instructional software in the Kingdom, four national software companies are currently leading software production and marketing.

These are*

Sakhr Software (SS), one of Al-Alamiah Group, which was established in 1975, is a pioneer in software production. Since the early eighties, (SS) has marketed more than two million programs for Arab consumers. (SS) produces its products in Egypt for technical and economic reasons.

Dowlog Technologies (DT) was established in 1992 in Riyadh, and is specialized in producing K-12 curricula software. It is the only Saudi software company that produces its products locally in the Kingdom.

Al-Mareefa Al-Saudia Company (AAC) was established in Riyadh in 1996 as an agent of Knowlodgy International Group in the USA. It produces its products of K-12 curriculum in Egypt.

Obeikan Home Interactive (OHI)was only recently established in 1998 in Riyadh. It is involved in Arabnization of foreign software produced by such international producers as Knowledge Adventure, Scholastic, and Discovery in the USA and Iona Software in Ireland.

Statement of the Problem: The study investigated the status quo of commercially produced software by Saudi national companies as well as certain aspects of the application of this software at selected private schools.

Purpose of the study. The major purpose of the study was to shed light on certain aspects of instructional software produced and marketed by national companies as

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*For more information about Saudi Software companies, you can visit their web sites shown below:

- SS : WWW.sakhr.com
- DT : WWW.dowlog. com
- AAC: WWW.mareefa. com
- OHI: WWW homeinteractive .com, WWW.arabiclibrary.com

well as to describe certain aspects related to the utilization of this software at selected private schools.

Research Questions: Two major questions were addressed in the study. They were as follows:

1. What is the status quo of instructional software produced and marketed by Saudi national companies in relation to the following aspects:

   a) Types of software applications b) grade levels and subject matters targeted by local companies, c) target audience, d) patterns of software utilization, e) methods of developing software, and f) perceived barriers facing expansion of software applications in Saudi education.

2. What is the status quo of instructional software utilization by selected private schools in terms of:

   a) patterns of utilization; b) grade levels with which software is most utilized, c) the extent to which available software meet curricula goals; d) sources of software used in the schools; e) information sources about available software, f) methods used for evaluating software utilization; and g) degree of teachers and students' satisfaction about the usefulness of software utilization.

Method: The survey method was applied. Two questionnaires were designed to collect data related to the study questions. One questionnaire was addressed to the general managers of four major national software production companies. The researchers met the general manager of each company, explained the purpose of the study, and handed the questionnaire. All four questionnaires were returned (return rate = 100%, n=4). The other questionnaire was addressed to 36 principles of private schools; (12 elementary, 12 intermediate, and 12 secondary schools, of which 50% boys schools and 50% girls schools), 26 questionnaires were returned (return rate = 72%, n=36). All the companies and schools are located in the capital city of Riyadh and have been deliberately selected for two reasons. First, these companies are currently the major instructional software producers and marketers in the Kingdom. Second, private schools in Saudi Arabia are major client of instructional software market, hence, expected to be active users of such software.

Importance of the study: This is the first study that addressed its concerns directly to the managers of software companies in Saudi Arabia through questionnaire. As such, it is considered a preliminary study that might shed light on important issues related to computer based instruction, in Saudi Arabia.

Literature Review: Literature review indicates that no study has been carried out regarding local producers of instructional software in Saudi Arabia. However, there exists few master thesis and other studies that addressed software utilization in schools. Al-Fantuk and Al-Sultan (1999) survey of 120 teachers and 580 secondary schools students revealed that more than 70% of teachers and students support the use of computer in the classroom; that computer acquisition in the Kingdom is the highest in the region, where 40% of teachers and 37.4% of students in the study own computer sets; that computer sets has increased in public secondary schools to hit the number of 24045 in 1998, thus decreasing the ratio of students to computer sets to one computer set for each 12.4 students in that year; and that only 30% of teachers were not in favor for the use of computer in the school because of language barrier, information illiteracy, perceived increase in teaching workload, and need to learn new teaching methods. Al Hazmi (1995)evaluated mathematics software utilized at teachers' college in Riyadh. Results showed that computer software were more effective than programmed texts and that students' attitudes toward computer based instruction were more positive than traditional instruction. Al-Jeraywai (1999) studied the effects of multimedia on the achievement of tenth graders in mathematics, but found no significant differences between achievement of students in experimental and control groups. Al-Mutairi (1998) investigated the effects of computer software on the achievement of sixth graders in general science, a significant difference (.05) was found in favor of software treatment at the first and second levels of Bloom cognitive taxonomy (knowledge and comprehension), but found no significant difference at the application level of that taxonomy. Al Omar (1999) found no significant differences between achievement of six grade math students in the data show treatment and that of students in the traditional group. Similarly, Al-Lohaib (1999) found no significant differences between achievements of tenth grade physic students in the computer-based treatment and that of those in the traditional group. Finally, Qwaifel (1992) evaluated available software used in teaching Arabic Grammar and general sciences in Jordan; he reported that these programs were consistent with only 48% of design criteria and 53% of subject matter experts' criteria; he also reported positive students' attitudes toward the benefits, ease of use, and enjoyment, of instructional software.

Results and Discussion:

Types of Software applications produced by Saudi Software Companies:

The major software applications produced by each of the four Saudi Software companies is presented in table 1*

Company	Software Applications
Sakar Software (SS)	Family Software, Educational Software, Corporate Software, Islamic Software, Internet Software, School Management Software.
Dowlog Technologies (DT)	School Curricula Software, Financial Software, Consulting Software, Training Software.
Al-Mareefa Al-Saudia Co. (AAC)	School Curricula Software, Management Software, Family Software
Obeikan Home Interactive (OHI)	Children Learning Software, Educational Games, Educational Software.

Table 1. Major Types of Software applications produced by Saudi Companies

Two companies, (DT) and (AAC) produce software that matches the content of Saudi general education curricula, while the other two (SS & OHI) produce software that is of supportive nature of school curricula. Also, (SS) is the major producer of school management systems (e.g. registration & transcripts, personnel affairs, school inventory, etc.). Currently, (OHI) is only involved in Arbnization and adaptation of foreign products via contracts with international companies.

Grade Levels Targeted by Saudi Software Companies:

Instructional software produced by (DT) and (AAC) are intended specifically to match Saudi curricula at grades 1-12, while (SS) produces software to support grades 10-12, and (OHI) markets Arbnized software that support grades K-9.

Target Audience:

Private schools as well as individual students represent the major client of commercially produced software in Saudi Arabia. Individual students buyers utilize Software at home. Private schools are profit driven, students pay fees for enrollment. Thus, in order to compete for more enrollment, these schools provide additional programs that are not offered by public schools, among which is computer literacy programs.

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* For more information about these applications, please check web sites shown on page no. 3

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Subject Matters Targeted by Commercially Produced Software:

All four surveyed companies seem to concentrate on producing multimedia CD ROM's in science studies, Math and English Language. Only (OHI) markets social studies software and only (SS) produces Islamic Software, while (OHI) and (AAC) market software in Arabic Subject Matters.

Patterns of Software Utilization:

Commercially produced instructional software in Saudi Arabia falls into three major patterns of utilization, namely, enrichment, computer literacy and total teaching. (DT) and (AAC) are heavily involved in producing software that cover exact content of grades 1-12 curricula, hence, intended for total teaching of subject matter, however, no company reported total teaching usage of their software. (SS) and (OHI) are more involved in producing educational software for enrichment purposes. In addition, individualized instruction is a major goal of produced software. (AAC) produces CDI, a television multimedia software that is intended to serve individual as well as group based, teacher-led instruction. This latter computer application is gaining wide popularity among private schools. Table 2 summarizes answers to the above issues raised by the first research question.

Method of Developing Software:

Data shows that software is developed cooperatively between software designers and subject matter experts. In terms of evaluation method and criteria, data indicates, that all four companies subject their products for internal evaluation by their own designers. Further, for all these companies, authority evaluation, is considered a major evaluation criteria. Finished and ready for marketing products are subjected for evaluation by Saudi authority of general education. Although external, this type of evaluation is some kind of official endorsement about the appropriateness of software for Saudi educational system. Such endorsement is used by these companies to promote their products, hence, increasing their sale. The companies did not mention pilot testing the software with sample of target audience during the stage of development (formative evaluation), nor did they mention measurement of students attitudes toward benefits of their software. However, there exists some master thesis's that compared the effectiveness of some software against traditional instruction. In brief, when asked about the purpose of evaluation, all companies agreed on the purpose of persuading target users about the benefits of their products which will eventually leads to increased marketing.

Company	Grade level	Subject Matters	Patterns of Utilization	Target Audience
Sakhar Software	10-12	• Science • English • Math • Islamic Studies	• Enrichment • Individualized Instruction	• Public and Private Schools • Individual Students
Dowlog Technologies	1-12	• General Science • Math • Physics, Chemistry • Geography • English Language	• Total learning / teaching • Individualized instruction	• Private Schools • Individual Students
Al-Mareefa Al-Saudia Co.	1-12	• General Science • Math • Physics, Chemistry • Geography • Arabic Language	• Total learning / teaching • Individualized Instruction • Group instruction	• Private Schools • Individual Students
Obeikan Home Interactive	K-9	• General Science • Math • Biology • Social Studies • Geology • English Language • Arabic Language	• Enrichment • Individualized Instruction	• Private Schools • Individual Students

Table 2. Grade levels, subject matters, patterns of utilization and target audience of instructional software produced by Saudi companies.

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Major Barriers Facing Expansion of Software Application:

The four general managers of companies surveyed, perceived certain barriers as the most important ones facing expansion of software application in Saudi education. However, they differ as to the far most important one. The far most important barrier perceived by each company were as follows:

(SS) : Continuous change in national curriculum.

(DTC): Lack of awareness about the usefulness of instructional software on the part of students and teachers,

(AAC): Lack of Adequate training on the part of teachers.

(OHI): Lack of appropriate computer hardware in schools.

Table 3. lists the major barriers perceived by the surveyed companies ranked according to importance.

	Barriers
1.	Continuous change in national curriculum
2.	Lack of awareness on the part of students and teachers toward the usefulness of instructional software.
3.	Inadequate administrative support.
4.	Lack of adequate teachers training.
5.	Lack of appropriate computer hardware in schools.
6.	Students and teachers' perceptions of instructional software as entertainment programs.
7.	Inadequate school financial resources to acquire instructional software.
8.	Cost of producing instructional software.
9.	Illegal copying of instructional software.
10.	Slow administrative procedures by target schools and or educational administration.

Table 3. Perceived barriers facing expansion of software utilization in Saudi general education.

From table 3, it is worth indicating that barriers 4,5 & 7, and 3 &10, are consistent with Ely' conditions (1990) of "Knowledge and Skills", "Resources", and "Commitment" respectively, that facilitate use of innovations.

Patterns of Instructional Software Utilization by the Schools:

Data analysis indicates that 77% of the schools participating in the study (n = 26) utilize software produced by Saudi companies for enrichment purpose, and 34% of these schools also utilize software for computer literacy, while no school indicated utilization for total teaching (See figure 1)

Grade Levels with which Software is most Utilized:

Although data showed that software is utilized across grades 1-12, grades 7-9 are the ones with which software is most utilized. All the principals of the intermediate schools in the study (100%, n=9) indicated software utilization at all grades in their schools. This is because private intermediate schools offere computer literacy programs not available in its counterpart of public schools in order to compete for enrollment. This is true in elementary schools as well. 78% (n=9) of these schools in the study utilize software in grades 3-6; while all secondary schools in the study (100, n=8) utilize software in grades 10 and 11; only 50% (n=8) of these schools utilize software in grades 10-12.

Extent to which Available Software Meet Curricula Goals:

Of all subject matters in grades 1-9, general sciences and social studies received the highest rate. 67% of principals of elementary and intermediate schools in the study (n=18), said that marketed software met between 50% - 75% of the goals of these two subject matters; where as 44% of these principals assigned this rate (50%-75%) to math, 39% to Arabic Language, 36% to religious studies and 33% to English Language.

In regard to subject matters taught at grades 10-12, data analysis showed that 88% of the principals of secondary schools in the study (n=8) indicated that available software met between 50%-75% of the goals of social studies; while only 50% assigned this rate to math, physics, English Language, and computer science, and 38% to chemistry. 75% of these principals said that available software met 50% of the goals of religious studies and 38% assigned the rate 75% to Arabic Language. The least met goals of subject matters at grade 10-12 were biology and geology, 88% of secondary schools principles said that available software met only 5%-10% of their goals.

Sources of Software Used in the School:

Most schools in the study obtain instructional software from local companies. 54% of these schools (n=26) get software from (DT), 58% from (SS), 50% from (AAC) and only 4% from (OHI) the most recent company. Further, 8% of these schools obtain software from Arabian companies in addition to local ones, and 19% indicated foreign sources (Learning Co., 4%; Future Kids, 16%) (See figure 2.)

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Information Sources About Available Sources:

Annual computer software exhibits in Riyadh, represented the most important source of information about available instructional software, 69% of the schools in the study (n=26) used this source for selecting needed software, followed by teachers' recommendations (50%), mailed information sent by software companies (23%), information published in local newspapers (19%) and international magazines 15% (see figure 3)

Methods of Evaluating Utilization of Instructional Software:

Most schools in the study (85%, n=26) used certain methods for evaluating utilization of software. The most prevailing method was an internal evaluation based on input from computer supervisors in the school.

Degree of Teachers and Students Satisfaction:

Most the principles of the schools in the study (92%, n=26), perceive high and medium degrees of satisfaction on the part of teachers toward the benefit of utilizing instructional software to support instruction. Only 8% indicated a week degree of satisfaction. Similar results pertain to students' degree of satisfaction, 50% of principals assigned a high degree of satisfaction and 50% assigned a medium degree

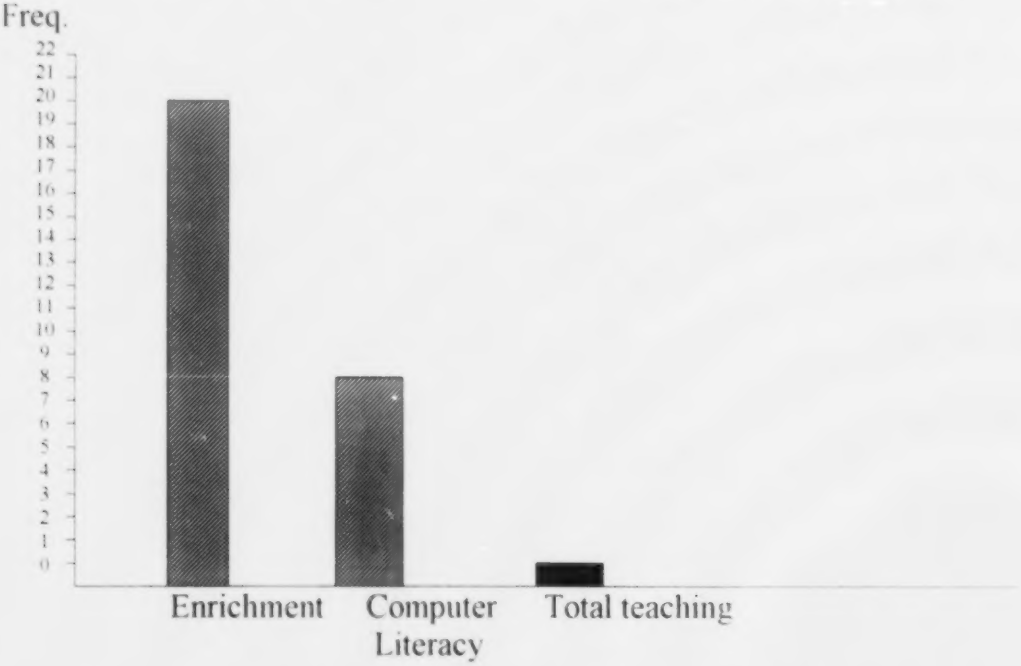

Figure 1. Patterns of software utilization (Freq. = number of schools)

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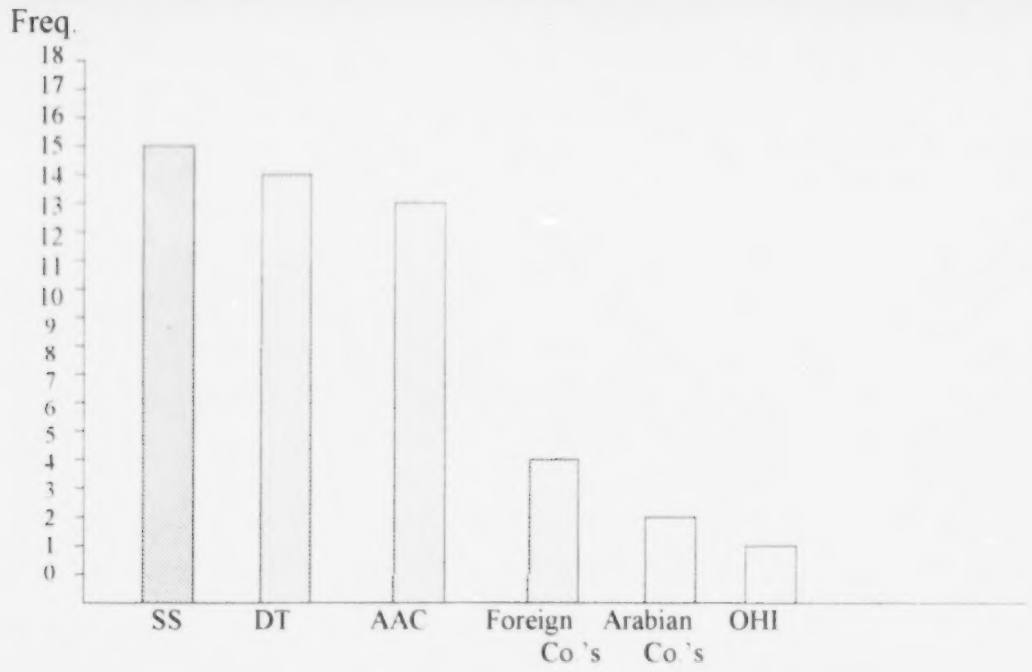

Figure 2. Sources of Software used in the schools (SS = Sakhr Software, DT = Dowlog Tech , AAC = Al-Mareefa Al-Saudia Co , OHI = Obeikan Home Interactive)

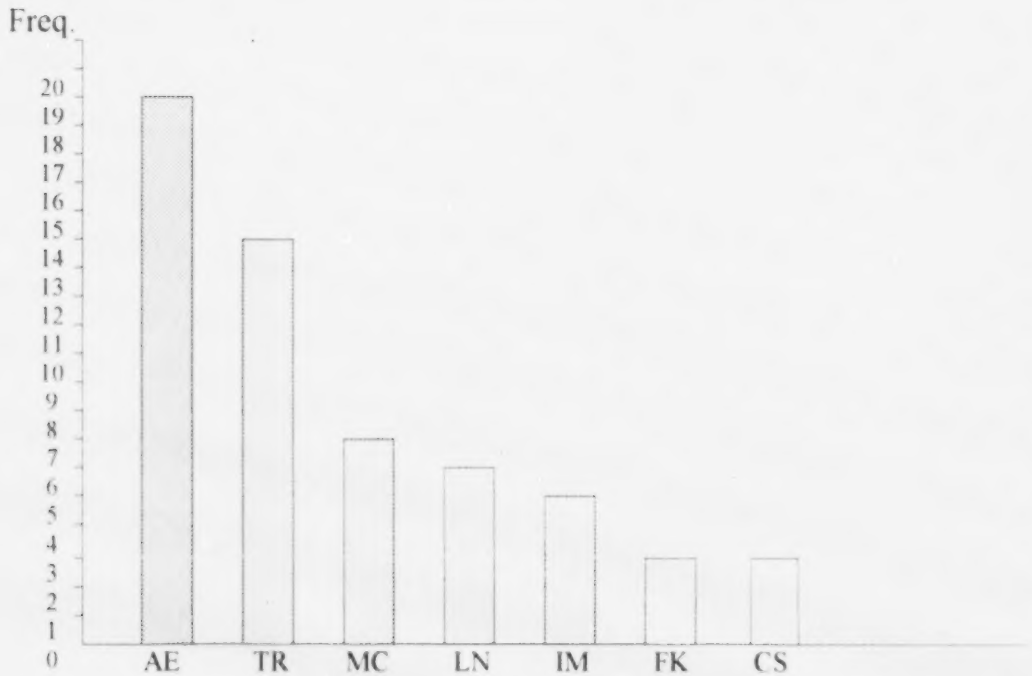

Fig. 3. Information sources about available instructional software (AE = Annual Exhibits; TR = Teachers' Recommendations; MC= Malied Correspondence; LN = Local Newspapers, IM = International Magazines , FK = Future Kids; CS = Computer Supervisor)

Note: Freq = no. of schools

Summary, Conclusions and Recommendations:

The study addressed certain aspects related to the status quo of commercially produced and marketed instructional software in Saudi Arabia as well as certain aspects of software utilization at selected private schools Currently, there exists four national software producers, of which two are heavily involved in producing 1-12 curricula software, the other two produce supportive software The study revealed that software is utilized for enrichment, and computer literacy purposes as well as in home individualized instruction Available software support most subject matters in grades 1-12, with few subjects far less supported Private schools and individual students are the major target audience of Saudi software market Software is internally and externally evaluated; however, formative evaluation is not present in the development process Most sources of schools software are local ones, and annual computer exhibits and teachers recommendations are the most important information sources about available software Continuous changes in national curriculum, lack of teachers and students' awareness, inadequate teachers' training, inadequate administrative support, inadequate budget, and lack of appropriate equipment in schools were the most important barriers toward expansion of software utilization in Saudi schools as perceived by general managers of Saudi software companies

It is concluded based on the study findings that commercially produced, marketed, and utilized software is promosing and is expected to gain wide spread as more and more support is provided by educational authority as well as private schools

Following are some recommendations to enhance and promote the status quo of software production, marketing and utilization

- As instructional software market is expanding, there is a need for other producers, such competition should help enhancing quality software and support variety
- There is a need for subject matter experts and instructional designers participation in the development process of instructional software Such involvement will support the process of design, evaluation and implementation, which are of significant importance in software production and utilization
- Training teachers and students in information technology skills is imperative, however, training need not be traditional In school training, continuous technical support and training on demand (EPSS) are some viable approaches to institutionalize computer-based instruction in Saudi schools
- This was a priminally study; thus, there is a need for more elaborated one that addresses variables related to teachers, students and parents attitudes toward instructional software utilization, cost-effectiveness, and frameworks for integrating computer technologies into school curricula

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